

REMARKS

Claims 17-24 are pending. Claims 17, 18 and 20-24 are rejected. Claims 17, 23 and 24 are amended. Support for the amendments can be found throughout the application, for instance in the claims as originally filed. No new matter is added. Claims 17-24 are submitted for further consideration at this time. Applicants respectfully request reconsideration and withdrawal of all rejections.

Claim Rejections - 35 U.S.C. 112

Claims 17, 23 and 24 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite. Applicants respectfully point out that the rejection is moot in view of the claim amendments indicated herein. Applicants urge withdrawal of all rejections.

Claim Rejections - 35 USC §103

Claims 17-18 and 20-24 are rejected under 35 USC §103 as being obvious over Marchetti et al. (EP 0812891). It is alleged that it would have been obvious to crosslink oligourethane to the perfluoropolyetheral prepolymer of Marchetti et al. in the coating composition as an alternative to regular urethane.

Applicants respectfully disagree. The present invention in a preferred embodiment is concerned with a method to form on surfaces of objects films having hydro and oil repellant properties, said method comprising applying to said surfaces aqueous dispersions of fluorinated oligourethanes having a number average molecular weight lower than or equal to 9,000, determined by vapour pressure osmometry, said

oligourethanes having a branched structure, optionally crosslinked, formed of the listed monomers and macromers a) and b); and one or more of the listed compounds c) and e); and optionally the listed compounds d) and d^I).

In contrast, Marchetti et al. is directed to protective coatings having as an essential feature no dirt pick-up in combination with high gloss, DOI (definition of image) and stain release, of compositions comprising (% by weight):

A) from 10 to 60% of A1) (per)fluoropolyetheral prepolymer having a polyisocyanic functionality, the prepolymer obtained by reacting a bifunctional, optionally polyfunctional (per)fluoropolyether, having hydroxylic functionality, optionally in admixture with monofunctional (per)fluoropolyethers, the fluoropolyethers having -CH₂OH terminations directly linked to a perfluoroalkylic group CF₂ or CF₂CFX (X = Cl, F), with a polyisocyanate containing isocyanurate rings, by utilizing an excess of isocyanate groups defined by NCO/OH equivalent ratio comprised between 10 and 2.

This fluoropolyether prepolymer can be partially or totally replaced by A2) non fluorinated polyisocyanates containing isocyanurate rings and/or hydrogenated polyisocyanate prepolymers;

B) from 0.1 to 50% of a (per)fluoropolyether having bifunctional hydroxylic functionality of the type -CF₂CH₂OH, -CF₂CFXCH₂OH (X = Cl, F) or CF(CF₃)CH₂OH; or polyfunctional hydroxylic functionality termination but containing at least 5% by weight of the same termination for the bifunctional indicated above, in admixture with mono- or polyfunctional perfluoropolyethers having an hydroxylic termination, optionally with diols and/or hydrogenated polyols having a low molecular weight; or (per)fluoropolyethers prepolymers as defined in A) but having a lower prepolymerization degree so to leave free oxydrylic functions of the type -CF₂CH₂OH, -CF₂CFXCH₂OH (X = Cl, F) or -CF(CF₃)CH₂OH indicated above; wherein the latter prepolymers can be used alone when component A) is 0%; and

C) 10-90% with respect of the resin of solvent belonging to the classes: ketones, esters, heteroalcohols esters, and aromatics (See paragraph spanning pages 2-3 of Marchetti et al.).

Applicants further point out that the polyurethanes of Marchetti et al. are soluble in organic solvents. This is clearly seen in Examples 1A and 2A, in particular at page 9, lines 9 and 58, respectively.

Applicants therefore respectfully urge that it is quite clear that the disclosure of Marchetti et al. is unable to teach or suggest any invention as claimed. Applicants note in particular that the compositions of Marchetti et al. do not include component b) of the claimed invention, that is, bifunctional hydrogenated monomers wherein one functional group is Y_0 (an anionic or cationic salifiable function). In other words, the Marchetti et al. reference is unable to teach or suggest component b) as required by the claimed invention. Indeed, Marchetti et al. contains absolutely no teaching or suggestion with respect to including any component b) as claimed in polyurethane compositions. Clearly, in the absence of the requisite teaching or suggestion, those of ordinary skill in the art would not have been motivated to include a bifunctional hydrogenated monomer component b) in polyurethane compositions, in order to obtain films having hydro and oil repellent properties, as in the claimed invention.

Furthermore, it is to be noted that Marchetti et al. teaches the disclosed compositions as being prepared in organic solvents. That is, the teachings of Marchetti et al. are not concerned with aqueous solvents. In contrast, the polyurethanes of the claimed invention can be prepared in aqueous solutions.

Thus, in view of the deficiencies of the disclosure of Marchetti et al., Applicants urge that those of ordinary skill in the art would find no teaching or suggestion concerning a method to form on surfaces of objects films having hydro and oil repellent properties, wherein such methods comprising applying on said surfaces aqueous

dispersions of fluorinated oligourethanes, as claimed. Applicants therefore urge withdrawal of all rejections.

In view of the amendments and remarks above, Applicants respectfully submit that this application is in condition for allowance and request favorable action thereon.

In the event this paper is not timely filed, applicants hereby petition for an appropriate extension of time. The fee for this extension may be charged to our Deposit Account No. 01-2300, along with any other additional fees which may be required with respect to this paper referencing Attorney Docket No. 108910-00009.

Respectfully submitted,

ARENT FOX KINTNER PLOTKIN & KAHN, PLLC

A handwritten signature in dark ink, appearing to read 'Hans J. Crosby', with a long horizontal flourish extending to the right.

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MARKED-UP COPY OF CLAIMS

Claim 17 (Twice Amended). A method to form on surfaces of objects films having hydro and oil repellant properties, said method comprising applying to said surfaces aqueous dispersions of fluorinated oligourethanes having a number average molecular weight lower than or equal to [9.000] 9,000, determined by vapour pressure osmometry, said oligourethanes having a branched structure, optionally crosslinked, formed of the following monomers and macromers:

- a) aliphatic, cycloaliphatic or aromatic polyisocyanates, having NCO functionality, determined by titration with dibutylamine-HCl (ASTM D2572), higher than 2;
- b) bifunctional hydrogenated monomers wherein the two functions are chemically different, having general formula:



wherein:

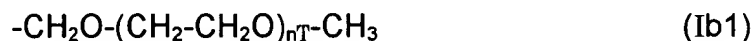
R_1^A and R_2^A , equal to or different from each other, are H, aliphatic radicals from 1 to 10 carbon atoms,

b is an integer in the range 1-20,

$X_0 = X_A H$ with $X_A = O, S$,

Y_0 is anionic or cationic salifiable function, or, when in the formula (Ib) $X_0 = OH$,

$b = 1$, $R_1^A = R_2^A = H$, Y_0 is [an] a hydrophilic group having formula



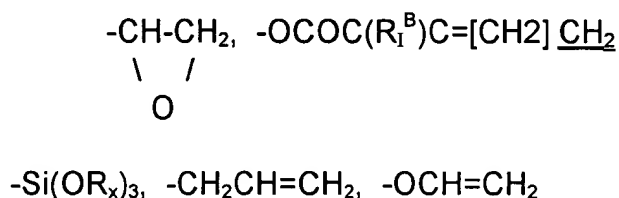
wherein nT is an integer in the range 3-20;

and one or more of the following compounds:

- c) bifunctional hydroxyl (per)fluoropolyethers having a number average molecular weight in the range 400-3,000;
- e) monofunctional hydroxyl (per)fluoropolyethers (e^0) or monofunctional hydroxyl (per)fluoroalkanes (e'), said compounds (e^0) and (e') having a number average molecular weight in the range 300-1,000,

and optionally the following compounds:

- d) hydrogenated monomers capable to insert a crosslinkable chemical function in the oligourethane, having the formula (Ib), wherein R_1^A , R_2^A , b and X_0 are as above [derined] defined and Y_0 is selected from the following functional groups:



wherein

$R_1^B = \text{H, CH}_3$;

R_x is a saturated $\text{C}_1\text{-C}_5$;

- dⁱ) hydrogenated-active compounds, capable to form bonds with the NCO functions stable at the hydrolysis by [lable] labile to heat.

Claim 23 (Amended). The method according to claim 17, wherein the number average molecular weight of c) bifunctional hydroxyl (per)fluoropolyethers (PFPE diols) [have a number average molecular weight] is in the range 700-2,000.

Claim 24 (Amended). The method according to claim 17, wherein the number average molecular weight of e) monofunctional hydroxyl (per)fluoropolyethers (e^0) or monofunctional hydroxyl (per)fluoroalkanes (e') [have a number average molecular weight] is in the range 400-800.